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The Ecosystem Approach and the Search for An Objective and Content for the Concept of Holistic Ocean Governance

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Introduction

That the need for a holistic approach to ocean governance has gained widespread acceptance warrants little debate.[1] Though concerns may continue to exist as to the practicality of a holistic approach (for example, that it might make decision-making too slow and cumbersome), there are examples of it being put into practice such as the EU's Marine Strategy Framework Directive[2] which requires the EU's member States to consider those parts of the oceans under their jurisdiction as an integral unit.[3] But there is a significant gap in our understanding of holistic ocean governance and that is as to the content of such an approach. While numerous treaties and statutes may be assumed to incorporate the concept, or to be relevant to holistic ocean governance, each may present a slightly different interpretation of how to apply the holistic approach. These variations in content reflect the fact that the objectives of each of these treaties and statutes are also many and varied. There is, therefore, still a need to develop a clear understanding of what is meant by the concept of a holistic approach.

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[1] See for example, "Introduction to the Special Issue: The Global State of the Ocean; Interactions Between Stresses, Impacts and Some Potential Solutions. Synthesis papers from the International Programme on the State of the Ocean 2011 and 2012 workshops" Forthcoming in Marine Pollution Bulletin (2013) http://www.stateoftheocean.org/pdfs/IPSO-Papers-Combined-15.1.14.pdf; Agenda 21 refers to the similar concept of integrated management in Chapter 17 *Agenda 21: A Programme of Action for Sustainable Development* U.N.GAOR, 46th Sess., Agenda 21, UN Doc A/Conf.151/26 (1992).

[2] European Union Marine Strategy Framework Directive 2008/56/EC OJ L 164/19

3 See also, for example the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention); OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic Statement on the Ecosystem Approach to the Management of Human Activities"Towards an Ecosystem Approach to theManagement of Human Activities" First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions (JMM) Agenda Item 5.

A good starting point may be to agree the content and a common objective, or common objectives for the approach. To provide such content and objective(s) for law as a whole would be a daunting and perhaps impossible task. Instead the focus of this paper is on considering the possibility of a principal objective or objectives for holistic ocean governance and possible content for that approach. It is suggested that the ecosystem approach may be used to set objectives for holistic ocean governance and to provide some content to that concept. The degree to which the ecosystem approach is already present in ocean governance instruments is, therefore, assessed to determine the feasibility of relying on this approach to provide the principal objective(s) and content for holistic ocean governance.

Ocean Governance Objectives

Numerous possible objectives for ocean governance can be gleaned from a review of oceans related treaties. These range from ensuring clarity as to the rights and obligations of States in relation to the oceans to enable States to enjoy those rights equitably without interfering with the rights of others[4] to ensuring cooperation in the management of high seas fisheries;[5] to the detailed objectives for the various sectors of activity that take place within the oceans. For example, in fisheries a key objective is to ensure the maximum sustainable yield of fisheries.[6] In biodiversity conservation the objectives are to ensure the continuing diversity amongst and within species, the sustainable use of biodiversity and fair and equitable sharing of the benefits of its use[7] in relation to pollution control the objective is to ensure that pollution levels are not so high as to cause harm to the environment or to humans.[8] In relation to minerals and hydrocarbons the objective may be described as being to secure the rights of States to

[4] See for example, the Preamble to the United Nations Convention on the Law of the Sea 1982 1833 UNTS 397 (UNCLOS)
[5] See, for example, *Behring Sea Fur Seals Case* (USA v. UK) (1898) 1 Moore's Int. Arbitration Awards 755 reprinted in 1 Int. Env. L. Reps (1999) 43; *Icelandic Fisheries Case (UK v Iceland)* ICJ Rep (1974) 3; UNCLOS Parts V and VII.
[6] UNCLOS Part V, Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 2167 UNTS 3 (1995 Fish Stocks Agreement).
[7] Convention on Biological Diversity 1992 (1992) 31 ILM 818 Articles 1 and 2.
[8] See, for example, UNCLOS Articles 194(3) and 196.

use these resources.[9] But these objectives are not necessarily complementary and instead compete to some extent or at least may interfere with each other. For example, the rights of States to exploit non-living resources may lead to significant pollution of the marine environment such as that seen following the BP Deepwater Horizon blow out in the Gulf of Mexico.[10] The pollution in turn may lead to harm to fisheries and to the interests of the fishing industry as well as harm to biodiversity. There is therefore a need for a principal objective or set of objectives to guide interactions between these various, treaty based, objectives. Without one there is the potential for protracted disputes following particular incidents, [11] for such disputes to impact adversely on future decision-making (perhaps making decision-makers more risk adverse than they need be) [12] and for controversy and delay to dog plans for new activities or infrastructure. [13]

A suitable principal objective might be to secure the rights of States, but such an objective again leaves the question of what hierarchy should exist amongst those rights should they come into competition. For example, a decision may have to be made then as to whether the production of energy should be prioritised over the protection of fisheries, or non-polluting activities prioritised over polluting. Taking such a principled approach may not, however, lead to the best outcome for ocean governance. There may be occasions where priorities should be reversed and yet a hierarchy of rights would not permit this to happen. An alternative is therefore required and there are a number of possible contenders for the title of principal objective. One such, is the concept of ecological integrity. This has been proposed as

[9] See, for example, UNCLOS Parts V and VI.
[10] See, for example, Lawrence C. Jr. Smith, L. Murphy Smith and Paul A. Ashcroft, "Analysis and Ecosystem Services Deprivation; From Cuyahoga to the Deepwater Horizon Symposium: Big Oil, Big Consequences, and the Big Unknown: Exploring the Legal, Regulatory, and Environmental Impact of the Gulf Oil Spill" (2010-2011) 74 Alb L Rev 563
[11] See, for example, litigation following the Deepwater Horizon blow out: Ed Crooks "BP Seeks Trial on Harm from Macondo Spill" FT 7 March 2014 http://www.ft.com/cms/s/0/54969242-a619-11e3-9818-00144feab7de.html#axzz30UX0Zfpx; Ed Crooks "BP Loses Appeal on Spill Compensation Terms" FT 4 March 2014 http://www.ft.com/cms/s/0/88467d3a-a35a-11e3-88b0-00144feab7de.html#axzz30UX0Zfpx
[12] See, for example, the decision of the German government to stop all use of nuclear fuel following the Fukushima disaster: "Germany: Nuclear power plants to close by 2022" BBC News 30 May 2011 < http://www.bbc.co.uk/news/world-europe-13592208>.
[13] See, for example, the debates over the Cape Cod wind farm: Todd Sperry "Wind Farm Gets US Approval Despite Controversy" CNN 7th August 2012 http://edition.cnn.com/2012/08/16/us/wind-farm-faa/.

a grundnorm for international environmental law,[14] but it could equally apply within ocean governance. Indeed, Kim and Bosselmann's suggestion for a principal objective grew from the appreciation that the current lack of one for international environmental law leads to inconsistencies as between international treaties, and to treaty regimes undermining each other. They therefore propose the adoption of ecological integrity as the principal objective of the international environmental law system. And they demonstrate that the concept of ecological integrity has been accepted in a number of treaties and soft law instruments.

While this suggested approach is very appealing, it has at least one problem and it is a problem that is shared across this type of objective setting approach in general. Kim and Bosselmann's suggestion is centred upon a very conservative approach to the environment. As they describe ecological integrity, Kim and Bosselmann contend that we need a baseline for measuring whether or not ecological integrity has been achieved or maintained and that we should use the biophysical conditions that existed in that part of the Holocene that occurred prior to industrialisation as the baseline indicators.[15] This argument suggests that they are in fact focussed not so much on maintaining ecological integrity as in maintaining the conditions in which humans can thrive.

Although Kim and Bosselmann's approach has much to commend it – no one might wish to argue against the idea of unpolluted seas, with abundant fish and a broad biodiversity – it appears not to account for human impact on the environment prior to the industrial revolution nor for one of the innate characteristics of ecosystems and societies: that they evolve over time.[16] And these issues say nothing of the difficulties we may have of determining the precise constituents of the ecosystem prior to industrialisation.

The failure to take account of the evolutionary characteristic of ecosystems is particularly problematic for two reasons – ecosystems rely for their resilience upon the ability to evolve. Removing that ability will remove the resilience of the

[14] Rakhyun E. Kim and Klaus Bosselmann, "International Environmental Law in the Anthropocene: Towards a Purposive System of Multilateral Environmental Agreements" (2013) 2 Transnational Environmental Law 285

[15] *Ibid* at 307.

[16] As recognised in, for example CBD Decision V/6, and in the Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute, Washington, DC. at 1. For a review of the ecological history of one marine ecosystem see: TC Smout and Mairi Stewart *The Firth Of Forth: An Environmental History* (Birlinn, 2012).

ecosystems.[17] While it is recognised that a conscious choice may be made to preserve an ecosystem in a particular state, that conscious choice and the outcomes it results in ought to be recognised as such. Yet the adoption of baseline conceptions may tend to obscure the choice that is being made and instead suggest that the ecosystem would naturally exist in a steady state, but for the interference of humans. Secondly, society has changed enormously since pre-industrial times. The world population has grown, for example, from an estimated less than 1 billion people pre-industrialisation to over 7 billion now and it is still growing. It is therefore unlikely that we can ever return the oceans to anything like their previous state and so adopting such an approach as an objective appears doomed to failure and to be perceived as a failure.

The problem of a conservative focus also affects other potential contenders for the title of principal objective. For example, one might choose sustainable development as the principal objective. As the literature indicates, however, the most popular conceptions of sustainable development have tended to be rooted in existing paradigms, particularly relating to economic development.[18] This is apparent in, for example, the original definition of sustainable development from the Brundtland Report: [s]ustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'[19] (emphasis added). It remains also in more recent enumerations of the concept such as the International Law Association (ILA) New Delhi Declaration.[20] Such rooting of any objective in an existing paradigm is problematic where it prevents the governance regime from tackling problems with the current perception and use of the oceans. For example, one issue to be addressed is overfishing.[21] The Food and Agriculture Organisation (FAO) biennial reports on the state of the worlds fisheries point to significant problems of overfishing for some species, such as Japanese anchovy and

[17] See, for example, the account of changes to the Grand Banks ecosystem in Kenneth T. Frank, Brian Petrie, Jonathan A. D. Fisher & William C. Leggett "Transient Dynamics of an Altered Large Marine Ecosystem" (2011) 477 Nature 86; and the account of damage to Jamaican coral reefs following a chain of events which started with over fishing, provided in Andrew Zolli and Ann Marie Healy, *Resilience – Why Things Bounce Back* (Simon & Schuster 2012).
[18] Duncan French, *International Law and Policy of Sustainable Development* (Dominic McGoldrick ed, Manchester University Press, 2005) particularly at p. 16; Andrea Ross, *Sustainable Development Law in the UK: From Rhetoric to Reality?* (Earthscan, 2012).
[19] World Commission on Environment and Development (WCED), *Our Common Future* (Oxford, 1987) 43.
[20] ILA, *New Delhi Declartion of Principles of International Law Relating to Sustainable Development* (ILA Report of the Seventieth Conference, New Delhi, London, ILA 25-9; UN Doc A/57/329, 2002)
[21] See, for example, FAO, The State Of World Fisheries And Aquaculture 2012 (Rome 2012)

Northwest Pacific and Chilean jack mackerel. The most recent report also indicates that while the total volume of wild caught fish has remained relatively stable for much of this century, a part of this stability may be due to improved reporting of fisheries statistics.[22] This suggests that, we may have moved even further into the realms of overfishing than was previously appreciated. Even if this is not the case, the most recent report also indicates quite clearly that we have now reached maximum capacity for marine capture fisheries as a whole, while exceeding it in relation to several species of fish. There are a number of causes of overfishing such as, illegal, unregulated and unreported fishing which it may, or may not be possible to attribute to the objectives of the legal system. Some of the problem can, however, be attributed to the current objectives of the legal regime. The concept of maximum sustainable yield used in fisheries,[23] for example, could be interpreted with a focus on biological sustainability. It is, however, interpreted to take account of socio-economic concerns with less emphasis on biological conceptions of sustainability than might be necessary to end overfishing.[24] If we are to tackle overfishing then a new objective may be necessarySimilarly, while there have been many measures adopted to reduce pollution,[25] problems remain. The increasing urbanization of the coastal zone around the world brings with it the threat of increasing marine pollution from land-based activities[26] and land-based activities are already the major source of the pollution in the oceans.[27] Thus we see, for example, problems of eutrophication leading to loss of biodiversity, changes in sediment mobility, changing habitats around the coast, and problems such as the increasing accumulation of litter in the oceans. This latter is

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[22] *Ibid*, 19 et seq.
[23] See UNCLOS Parts V and VII.
[24] Harry N Scheiber and Christopher J. Carr, "From Extended Jurisdiction to Privatization: International Law, Biology, and Economics in the Marine Fisheries Debates, 1937-1976" 16 Berkeley J Int'l L 10
[25] These range from the conventions adopted under the auspices of the IMO to tackle ship based pollution, such as International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) (1973) 12 I.L.M. 1319; Protocol 1978, (1978) 11 I.L.M. 546; London Dumping Convention (The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter) 1972 (1972) 11 I.L.M. 1291 and; Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London, 1996 (1997) 31 I.L.M. 1 to the soft law United Nations, *Global Programme of Action for the Protection of the Marine Environment from Land-based Activities* (UNEP(OCA)/LBA/IG.2/7, 1995).
[26] UNEP, *Protecting the Ocean From Land-Based Activities: Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment* (GESAMP Reports and Studies No 71, 2001) at 31.
[27] UNEP, *The State of the Marine Environment* (GESAMP Reports and Studies No 39, 1990; UNEP; *Report of the Secretary General, Ocean and the Law of the Sea* (UNGA Doc A/59/62/Add1 (18 August 2004)).

causing significant problems for wildlife – whether that is fish caught in ghost fishing nets,[28] or whales killed by eating plastic sheeting from agriculture which has been lost to sea during storms,[29] or other marine life being choked by debris at sea. While we may at first perceive these problems as problems for the conservation of biodiversity, they also represent significant problems for fisheries, reducing the capacity of species to breed and increasing mortality amongst target and non-target species. Whilst arguably these weaknesses do not prevent the objectives outlined above forming a basis for holistic ocean governance, they do suggest that such a marriage is unlikely to address the problem that holistic ocean governance is designed to address, that is, the declining state of the oceans.[30]

A possible solution might be to adopt a more proactive principle such as the precautionary principle, or precautionary approach,[31] which addresses decision-making in the context of scientific uncertainty, erring on the side of prevention of harm. Besides the problem that the precautionary approach has yet to be fully accepted as a general principle of customary international law[32] practice shows that its lack of precision makes implementation problematic. For example, the London Dumping Convention, as amended by the 1996 Protocol, requires a precautionary approach to be taken to dumping, yet, its parties permitted the sequestration of carbon dioxide in the seabed before concrete standards for the regulation of this activity had been adopted contrary to scientific advice.[33] Similarly, Articles 5 and 6 of the 1995

[28] United Nations General Assembly Resolution on Large-scale Pelagic Driftnet Fishing and its Impact on the Living Marine Resources of the World's Oceans And Seas. A/RES/44/225 1989

[29] Giles Tremlett "Spanish Sperm Whale Death Linked to UK supermarket Supplier's Plastic: Sperm Whale on Spanish Southern Coast Had Swallowed 17kg of Plastic Waste Dumped by Greenhouses Supplying Produce to UK" Guardian On Line 8 March 2013 < http://www.theguardian.com/world/2013/mar/08/spain-sperm-whale-death-swallowed-plastic>

[30] Millennium Ecosystem Assessment n.16.

[31] See, for example, the Rio Declaration on Environment and Development, U.N. Conference on Environment and Development, U.N. Doc. A/CONF.151/5Principle 15 which notes that "where there are threats of serious and irreversible change, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." See also, the World Summit on Sustainable Development Plan of Implementation UN A/Conf.199/20 4 September 2002 paragraphs 22 and 103.

[32] Cf. Pulp Mills on the River Uruguay (Argentina v Uruguay) (2010) ICJ ; Responsibilities and Obligations of States Sponsoring Persons and Entities With Respect to Activities in the Area Advisory Opinion (2011) ITLOS; Gabčikovo-Nagymaros Dam Case (1997) ICJ Rep 62; The MOX Plant (Ireland v. UK) Case Provisional Measures (3 December 2001) ITLOS; and the Case Concerning Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v. Singapore), Provisional Measures (8 October 2003) ITLOS.

[33] International Panel on Climate Change, *Special Report on Carbon Dioxide Capture and Storage* (2005; *Resolution on the Amendment to Include CO2 Sequestration in Sub-Seabed Geological Formations in Annex 1 to the London Protocol* (2006).

Fish Stocks Agreement require the adoption of a precautionary approach by States cooperating in the management of the stocks addressed by it. Yet the state of the world's fish stocks suggests that this requirement is not being adhered to. It seems unlikely then that adoption of a proactive approach such as the precautionary approach would make any significant difference to ocean governance at this stage.

Process Based Holistic Governance

It is perhaps because of the problems associated with a principled approach to ocean governance that process based solutions to ensuring holistic governance of the oceans have been suggested. One aspect of the appeal of these solutions is that they avoid the need for a principal objective. Instead, concepts such as good ocean governance[34] set out processes by which we might better manage the oceans. For example, good ocean governance requires that certain procedural requirements are met in decision-making: the rule of law is complied with, participatory decision-making is provided for, there is transparency in the decision-making process, decisions should be based on consensus, decision-makers should be subject to accountability, the system should provide for equity and inclusiveness in the governess of the oceans, the system should be responsive and coherent.[35]

Reliance on process based concepts alone to guide ocean governance may, however, prove problematic. The problems of over use and pollution described above suggest that decision-makers are unable to respond to the scale of the problems faced in the oceans. Thus, while there may be examples of good practice,[36] Hardin's "tragedy of the commons"[37] can clearly be seen in oceans governance. The problems referred to earlier in the paper indicate that the current systems and processes are not working. It is unclear if this is due to the processes per se (they may, for example, allow

[34] Yen-Chiang Chang, "Good Ocean Governance" (2009) 23 Ocean Yearbook 89
[35] Ibid.
[36] See, for example, the modest increase in total allowable catch of Flemish Cap cod and Grand Banks redfish stocks in the NAFO region following conservation measures: EU Press release – 27/09/2010, The EU welcomes NAFO's unprecedented precautionary measures for the conservation of international fish stocks < http://ec.europa.eu/fisheries/news_and_events/press_releases/270910/index_en.htm>.
[37] Garrett Hardin "The Tragedy of the Commons" (1968) Vol. 162 no. 3859 Science 1243-1248

particular advocacy coalitions[38] to exert undue influence,)[39] or to other problems. For example, there is a relative lack of scientific data on our oceans,[40] which may lead to imperfect decisions regardless of the process followed or principles applied. Even without such problems, process based solutions provide no way to tackle one of the problems identified earlier - problematic existing paradigms. These may well need to be addressed to ensure a particular outcome (for example, that fisheries are preserved at sustainable levels). Yet process based systems cannot guarantee, for example, that the concept of maximum sustainable yield is reinterpreted to take greater account of the interactions of species, or the impact of fishing activities on biodiversity, Nor can they ensure that principles such as the precautionary principle are interpreted and applied in particular ways. Process based approaches alone are, therefore, unlikely to provide the solution needed to the problems that holistic governance is aimed at tackling. What is required then is an approach that combines a process based approach to decision-making with an objective, or set of objectives to guide that decision-making process. It would be possible to create such an approach by developing the arguments presented earlier and so to combine, for example, ecological integrity with good governance. But to do so would equate to the introduction of a new concept and the introduction of any new concept or process brings with it the need to overcome the path dependent[41] or autopoietic[42] nature of all legal regimes. It would be better then to look to a tool that is already available, and accepted (at least to some degree) to establish whether or not it might point us to a

[38] Adrian Smith, "Policy Networks and Advocacy Coalitions: Explaining Policy Change and Stability in UK Industrial Pollution Policy?" (2000) 18 Environment & Planning C: Government and Policy 95.
[39] Elizabeth A. Kirk, "Marine Governance, Adaptation and Legitimacy" (2011) 22 Yearbook of International Environmental Law 110
[40] Harry N. Scheiber, "Ocean Governance and the Marine Fisheries Crisis: Two Decades of Innovation - and Frustration 20th Anniversary Commemorative Issue: Essay" (2001) 20 Va Envtl LJ 11; David Balton, 'The Bering Sea Doughnut Hole Convention: Regional Solution, Global Implications' in Olav Schram Stokke (ed), *Governing High Seas Fisheries: The Interplay of Global and Regional Regimes*, (Oxford University Press 2001); Benjamin K. Sovacool and Kelly E. Siman, "Revoking a License to Krill: What the United States Can Do to Save Fish Stocks in Antarctica" (2008-2009) 11 Journal of International Wildlife Law and Policy 1.
[41] W. Brian Arthur, "Competing Technologies, Increasing Returns, and Lock-In by Historical Events" (1989) 99 Economic Journal 116 – 131; W. Brian Arthur *Increasing Returns and Path Dependence in the Economy* (University of Michigan Press, 1994). See also Elizabeth A. Kirk, Alison D. Reeves and Kirsty L. Blackstock "Path Dependency and Environmental Regulation" (2007) 25 Environment and Planning, 250-268
[42] Niklas Luhmann, *et al*., *Law as a Social System* (Oxford University Press, 2004); Gunther Teubner *Autopoietic Law: A New Approach to Law and Society (*Walter de Gruyter, 1988); Gunther Teubner, *Law as an Autopoietic System* Ed. Z Bankowski (translated by A Bankowska, R Adler) (Blackwell, 1993).

suitable objective, or objectives and decision making process for holistic ocean governance. The particular tool focussed on in this article is the ecosystem approach.

The next section of this paper explains how the ecosystem approach might be used to set objectives for holistic ocean governance. Thereafter the degree to which it is already present in ocean governance instruments is considered.

The Ecosystem Approach and Holistic Ocean Governance

(i) The Ecosystem Approach

There is no single agreed definition of the ecosystem approach,[43] but, as the UN General Assembly has noted, "[t]he concept is generally associated with management based on the "best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function"."[44] It has also been described as an integrated approach to decision-making, which applies appropriate science and a particular methodological framework for supporting decision-making taking account of socio-economic factors as well as focussing management of ecosystems on the ecosystems processes rather than on the constituent elements of the ecosystem.[45] This description suggests that the ecosystem approach is again focussed on process and process alone, but, in reality the ecosystem approach goes further. A better understanding of the approach can be gained by turning to what may be termed the constitutional documents of the approach. While there are a number of variants on the approach, such as fisheries based large marine ecosystem approach,[46] it is possible to glean some common elements. These are most clearly enunciated through the decisions of the Conference of Parties to the Biodiversity Convention, in particular Decision V/6.[47] The explanation of the approach provided by Decision V/6 indicates

[43] The ecosystem approach is one of a number of terms, including the ecosystem-based approach, ecosystem management approach and integrated ecosystem management. All are focused upon conservation and management activities that are holistic and scientifically grounded.
[44] UN General Assembly 61/63 para 107 referring to Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management (1996).
[45] See for example, the preamble to Dec VII/11 of the COP to the Biodiversity Convention.
[46] See for example, Lawrence Juda, "Considerations in Developing a Functional Approach to the Governance of Large Marine Ecosystems" (1999) 30 Ocean Development & International Law, 89-125 on the similar, fisheries focussed, concept of Large Marine Ecosystems.
[47] These provisions are reflected elsewhere, such as, in the Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting A/61/156.

that it combines both process with objectives. Paragraph 1 describes it as "a strategy for the integrated management of land, water and living resources" but it is a strategy with a particular objective. The objectives given, again in paragraph 1, are the promotion of "conservation and sustainable use in an equitable way." These twin elements of the ecosystem approach are further elaborated in the 12 principles set out in Decision V/6. While the very first principle appears to suggest that the objectives of ecosystem management are left to each society to decide (so threatening a rather weak set of provisions) the principles that follow this make it clear that any such perception is misplaced. The choice of conservation and management objectives is to be made within the framework of principles provided for in COP Decision V/6.

Three of the principles are focussed on the process to be used in decision-making addressing both who ought to be involved in decision-making and the type of information to be taken into account:

- Management of ecosystems should be decentralised and take place at the lowest appropriate level.
- All forms of information and knowledge should be drawn upon in decision making including scientific, indigenous and local knowledge.
- The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

A further four address the types of issues to be taken into account in decision-making. In so doing they set some parameters within which decisions should be made:

- The transboundary effects of management decisions on neighbouring ecosystems should be considered by those managing the ecosystem.
- The approach must be applied at the appropriate spatial and temporal scales.
- Ecosystems should be managed in an economic context i.e. taking account of externalities either that impact on the ecosystem or that are created by its management and incentives should be created to promote its conservation.
- An appropriate balance between conservation and use of biodiversity should be struck.

These four also suggest that the Parties to the CBD had certain objectives in mind when establishing the ecosystem approach. This impression is reinforced by the last four principles:

- A priority is to maintain ecosystem services by conserving the functioning of ecosystems or their structures.
- "Ecosystems must be managed within the limits of their functioning."
- Long-term objectives should be set to take account of the variability of ecosystems across time.
- Management must recognize that change is inevitable.

These last four principles have the potential to provide a set of principal objectives for holistic ocean governance. And while it might appear at first that these four principles provide for something very similar to the concept of ecological integrity suggested by Kim and Bosselmann, there are some fundamental differences. One key difference is that the final two expressly recognise that change and variability are normal characteristics in ecosystems whereas ecological integrity , as expressed by Kim and Bosselmann, is based upon the assumption that ecosystems respond to disturbance by returning to a function and structure previously identified as normal for that system. It is this focus on a steady state that makes their concept of ecological integrity conservative. By contrast the acknowledgement in the ecosystem approach of the natural phenomenon of change in ecosystems enables that approach to pay more attention to current and future issues and states.

The prospective focus of the ecosystem approach can also be seen in other discussions of it. For example, while the UN General Assembly has described the ecosystem approach in terms that at first appear to be quite conservative:

> "The goal of the ecosystem approach is to restore and sustain the functions of ecosystems, based on their health, productivity and biological diversity, and the overall quality of life through management systems that are fully integrated with social and economic goals, for the benefit of current and future generations." [48]

It goes on, in the same statement, to present a more forward looking vision of the ecosystem approach which takes account of future needs:

[48] UN GA 61/63 para 118 (footnotes omitted) referring to The Ramsar Convention on Wetlands, Strategic approaches to freshwater management: Background paper — The ecosystem approach; Report of the Expert Consultation on Ecosystem-based Fisheries Management, held in Reykjavik from 16 to 19 September 2002.

> "the goal of the ecosystem approach to fisheries is to plan, develop and manage fisheries in a manner that addresses the multiplicity of societal needs and desires, **without jeopardizing the options for future generations to benefit from a full range of goods and services provided by marine ecosystems**."[49] (emphasis added)

A second distinction is that the ecosystem approach focuses largely on preserving ecosystem functions, structures and services, which may appear to be a lower standard than that called for in preserving ecological integrity. However, any such perception would be based upon a misapprehension of what it means to preserve ecosystem functions and structures. Ecosystem functions may be described in terms of the interactions of the structural components of the ecosystem.[50] The structural components refer to the living organisms as well as the mediums (soil, water, atmosphere) in which these organisms are found. Thus the requirement to preserve the functions and structures of ecosystems is not necessarily any lower a standard than the standard of preserving ecological integrity. The only distinction is that when taken as a whole the ecosystem approach clearly provides for account to be taken of the intrinsic variability of ecosystems across time.

In total then this combination of goals makes it clear that the ecosystem approach is less prescriptive than the idea of ecological integrity provided by Kim and Bosselmann and less rooted in a conservative approach.

In relation to concepts such as sustainable development and the precautionary principle the ecosystem approach also has the advantage that it does place certain limitations upon the use of ecosystems. These limitations may avoid the possibility of interpretation of the approach to suit the existing status quo. Thus while, for example, popular interpretations of sustainable development have emphasised the importance of development and meeting socio-economic needs,[51] more attention must be paid to ecological needs under the ecosystem approach because of the requirement that decisions are constrained by the limits of ecosystem function and by the need to preserve services and functioning. In other words, there appears to be less possibility

[49] Ibid.
[50] Ross A. Virginia and Diana H. Wall, 'Principles of Ecosystem Function' in *Encyclopedia of Biodiversity* (Second edn, Elsevier 2013)
[51] French n.18, Ross n. 18.

of trading environmental benefits for economic or social benefits if such trade will damage ecosystem functioning.

It is this combination of advantages that leads me to suggest that the ecosystem approach provides a suitable set of principal objectives and processes to use to provide content to the concept of holistic ocean governance. The suggestion does, however, come with a health warning. If this approach is adopted it may require a fundamental change in how humans engage with the environment around themselves. Our tolerance for pollution, for example, may have to be lowered. Given the problems of overfishing, and the problems created by pollution in our seas at present, such a fundamental shift may be no bad thing, indeed it may be absolutely necessary if we are to tackle these problems and secure our own futures. The question then is: just how radical a shift would we be required to undertake? The next section of the paper proffers an answer to that question by considering the degree to which the ecosystem approach is already incorporated into relevant international agreements.

(ii) The Ecosystem Approach and Ocean Governance

It appears from the discussion above that the ecosystem approach may address many of the deficiencies found in other approaches that are or could be used in ocean governance. There are, however, some potential weaknesses with the ecosystem approach. A primary concern is that the way some of the principles are described in Decision V/6 leaves much to be decided at a later stage. For example, the statement that management should take place at the lowest appropriate level, leaves determining that level to later decision-makers. While the rationale for the principle indicates that the lowest appropriate level is determined by the ecosystem to be managed, that still begs the question of how decisions are to be made as to which ecosystem should be focussed on. For example, if focussing on managing fisheries or renewable energy off the coast of Scotland near Edinburgh a variety of ecosystems could be chosen as the focus for decision-making. These include the ecosystem in the Firth of Forth, or the North Sea ecosystem or the North-east Atlantic ecosystem. Which ecosystem is chosen as the locus for management decisions will determine factors such as which stakeholders will be involved in decision making, what type of information should be

included, where transboundary impacts may be felt. The possible combinations of these variations in the application of the ecosystem approach lead to a potentially wide variety of possible outcomes to the decision-making process. While this delegation of decisions on how the ecosystem approach is to be applied could be viewed as problematic in that it leads to some uncertainty as to how the approach is to be applied, it is also a potential strength of the approach. The lack of prescription as to precisely how the ecosystem approach is to be implemented allows for adaptation in its use in response to the needs of particular ecosystems or societies. Moreover, a framework for its application ***is*** provided through the four principal objectives identified above. The key in this context is that the level chosen must be capable of ensuring that the functions and structure of ecosystems are maintained. Thus the lowest appropriate level for decision-making may be determined by considering what types of decisions need to be made to enable preservation of function and structures and whether those decisions should be made at the local level (for example in relation to the daily management of coastal wetlands), at the regional level (for example in relation to planning decisions, or allocations of rights to take) or at the national or international levels.

Secondly, the fact that the ecosystem approach was developed in the context of protection of biodiversity may appear to limit its applicability to other areas of ocean governance. It was first applied through the 1980 Convention for the Conservation of Antarctic Marine Living Resources,[52] before being developed through the 1992 CBD. However, a closer examination of ocean governance demonstrates that the application of the ecosystem approach is not wholly confined to the protection of biodiversity. As noted in the 2006 Report of the UN Open Ended Informal Consultative Process[53] a number of treaties and soft law agreements contain measures that may be equated with at least parts of the ecosystem approach. Thus we find elements in the 1972 London Dumping Convention and its 1996 Protocol; MARPOL 73/78; UNCLOS; the 1995 Fish Stocks Agreement; the 1992 United Nations Framework Convention on Climate Change[54] and the 1997 Kyoto Protocol;[55] the 2001 Stockholm Convention on

[52] Convention on the Conservation of Antarctic Marine Living Resources 1980 (1982) 1329 U.N.T.S. 47.
[53] UN GA 61/63.
[54] United Nations Framework Convention on Climate Change 1992 (1992) 31 I.L.M.
[55] 1997 Kyoto Protocol to the UNFCCC 1992 (1998) 37 ILM 22

Persistent Organic Pollutants (POPs Convention);[56] and the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments;[57] as well as in the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);[58] the 1979 Bonn Convention on Migratory Species (CMS)[59] and soft law instruments such as the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, 2001;[60] the 1995 Code of Conduct for Responsible Fisheries;[61] Global Programme of Action for Land-based Sources of Marine Pollution;[62] the Johannesburg Plan of Implementation of the World Summit on Sustainable Development 2002[63] and the IMO Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas (PSSAs).[64]

For example, UNCLOS and the 1995 Fish Stocks Agreement contain some elements of integrated decision-making. Both provide that decisions on fisheries are to take account of environmental, scientific, economic and social factors[65] and to take account of the impact on associated or dependent species when establishing conservation measures.[66] The 1995 Fish Stocks Agreement goes further in, for example, also requiring States to take account of the transboundary impacts of their decisions.[67] The Code of Conduct for Responsible Fisheries goes further still in both reiterating and strengthening these provisions and, for example, calling on parties to take account of the appropriate spatial scale.[68] Similarly the Reykjavik Declaration calls for managers to take account of the impact of fisheries on the marine ecosystem and vice versa[69] and the CCAMLR requires States to have regard to the "maintenance of the ecological relationships between, harvested, dependent and related populations"

[56] Stockholm Convention on Persistent Organic Pollutants (POPs) as amended in 2009 <http://chm.pops.int> (2001)
[57] International Convention for the Control and Management of Ships' Ballast Water and Sediments IMO Doc. BWM/CONF/36 (2004)
[58] Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 993 UNTS 243
[59] Convention on the Conservation of Migratory Species of Wild Animals 1979 1651 U.N.T.S. 333 (Bonn Convention)
[60] C 2001/INF/25 Appendix 1
[61] FAO, *Code of Conduct for Responsible Fisheries* (1995)
[62] UNEP(OCA)/LBA/IG.2/7 5 December 1995
[63] A/CONF.199/20
[64] IMO, *Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas* (IMO Assembly Resolution A982(24), 2005).
[65] UNCLOS Article 61, 1995 Agreement Article 5.
[66] UNCLOS Articles 61 and 119, 1995 Agreement Article 5.
[67] Article 7.
[68] Paragraph 6.8 and 7.3.1
[69] UN GA 61/63 para 130

while fishing.[70] It also takes account of the need to consider the appropriate spatial scale for decision-making in providing first that it applies to the area of the globe south of 60° latitude and secondly that it also applies to activities north of that line of latitude if they have a negative impact on the ecosystem within the jurisdiction of the CCAMLR.[71] In addition the CCAMLR provides for account to be taken of the relationships between dependent, harvested, and related species and that fisheries management decisions are to be aimed at ensuring sustainability of the fish stocks.[72]

Similarly, UNCLOS and the 1972 Dumping Convention note the need to control pollution to prevent interference with other uses of the seas and to prevent harm to marine life.[73] UNCLOS also notes the need to prevent the transfer of pollution from one medium to another[74] and of course the 1972 Dumping Convention and its 1996 Protocol are designed to address precisely this problem.

The POPs Convention is based on the premise that the use of chemicals, such as pesticides, should take account of the long-term impacts of such chemicals as well as their immediate impact on the environment. It is specifically designed to tackle the problems of bio-accumulation of these chemicals across time and so takes account of the need for planning to take place at the appropriate temporal scale. It also provides other elements of the ecosystem approach, such as making provision for involvement of various sectors of society in decision-making.[75] Similarly the Global Programme of Action is based upon the premise that "the sustainable use of the oceans depends on the maintenance of ecosystem health, public health, food security and economic and social benefits, including cultural values."[76]

These examples point to the acceptance of the ecosystem approach across a range of issues in ocean governance, but they also indicate that such acceptance is incomplete in that none of the instruments incorporate all aspects of the ecosystem approach. In part this is due to the fact that some of the instruments were adopted before the ecosystem approach had been fully developed, in part it indicates a less than complete acceptance of the approach. A second issue is that most of these treaties, like the

[70] Art 2(3)(ii)
[71] CCAMLR Article I and XI
[72] Article II
[73] UNCLOS Article 194 and London Dumping Convention Article I.
[74] Article 195.
[75] Article 10.
[76] UN GA 61/63 para 128 referring to the GPA

Convention on Biodiversity, are based on a sectoral approach to ocean or environmental governance. Only UNCLOS could be described as taking a truly integrated approach and even there one may question just how integrated the approaches provided for in UNCLOS are in that each sector is addressed in separate parts of UNCLOS. The other global treaties discussed above, while they may apply elements of the ecosystem approach, are intrinsically incapable of applying it completely.

Similar issues are seen in other treaties. For example, a review of implementation of the ecosystem approach within regional seas programmes demonstrates that aspects of the ecosystem approach have been adopted in these programmes too, but while few of these regimes address all sectors of ocean governance, many are designed to take a more integrated approach to ocean governance than the regimes described above.

Different regional seas emphasise different aspects of the ecosystem approach in the measures they have promoted. For example, HELCOM is based upon the notion of preserving the ecological balance of the Baltic Sea.[77] This leads then to the question of whether the convention reflects the ecosystem approach or a more conservative approach, such as pursuing ecological integrity. The answer appears to be found in Article 15 which expressly refers to the adoption of measures to preserve biodiversity and ecological processes. This latter phrase appearing very similar to the term "ecosystem functions" found in the ecosystem approach, suggesting that the regime reflects that approach. Other elements of the ecosystem approach are also evident in the Helsinki Convention. For example, Article 3 provides for account to be taken of the transboundary impacts of activities within the Baltic on areas beyond its jurisdiction. Similarly Article 17 provides for the involvement of stakeholders in decision-making through the provision of information to the public. Similar provisions are found in other regimes[78] such as the Barcelona Convention, applicable in the Mediterranean.[79]

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[77] Convention on the Protection of the Marine Environment of the Baltic Sea, Helsinki 1992, (2002) 2099 U.N.T.S 195 (Helsinki Convention) Article 3.

[78] See, for example, the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region, Nairobi, 1985 (Nairobi Convention) <http://www.unep.org/NairobiConvention/The_Convention/Nairobi_Convention_Text/index.asp> Article 15 and Article 20 of the Framework Convention for the Protection of the Marine Environment of the Caspian Sea, Tehran, 2003 (Tehran Convention) <http://www.tehranconvention.org>

[79] Barcelona Convention for the Protection Of The Mediterranean Sea Against Pollution 1976 (1978) 1102 U.N.T.S. 27.

These regimes then go some way towards addressing the requirement that all relevant sectors of society should be involved in the ecosystem approach. The provision of information may of course be viewed only as a first step in such involvement, particularly if one equates engagement with public participation.[80] Some regimes do go a little further, but even where they do so their treaty provisions are rather weak. For example, the Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region[81] to the Nairobi Convention makes mention in Article 12 of the need to take account of traditional activities in areas that are to become protected areas, but makes no mention of the need to involve indigenous peoples in the establishment or management of the areas. Thus it may be enough simply to gather information on such activities for use in decision-making rather than actually involving the local population as a relevant sector of society. The soft law provisions attached to regimes also provide an opportunity for an expansion, or development of provisions found in the treaties. Thus for example, the provisions on involving various sectors of society in decision-making have been expanded upon in a number of regimes in this way. For example, the Parties to the Nairobi Convention have entered into memoranda of understanding with a number of global and regional NGOs such as WWF, the Western Indian Ocean Marine Science Association (WIOMSA), BirdLife International and the Wildlife Conservation Society (WCS).[82] While engagement with these NGOs may not fully satisfy the requirement in the ecosystem approach to involve all relevant sectors of society and scientific disciplines it is a move in the right direction in so far as it broadens the range of actors involved in decision making and moves away from government by bureaucrats[83] alone.

The Parties to the Barcelona Convention have also made provision to draw a range of actors into actions to implement the Barcelona Convention through a partnership agreement established under the Mediterranean Action Plan Phase II.[84] But even where fuller rights to participate are provided under soft law provisions, these do not

[80] Sherry R. Arnstein, "A Ladder of Citizenship Participation" (1969) 26 Journal of American Institute of Planners 216.
[81] Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region, Nairobi, 1985 <http://www.unep.org/NairobiConvention/The_Convention/Nairobi_Convention_Text/index.asp>
[82] <http://www.unep.org/NairobiConvention/The_Convention/Institutional_Structure/Partners.asp>
[83] See, for example, Kirsty L. Sherlock, Elizabeth A. Kirk and Alison D. Reeves "Just the Usual Suspects? Partnerships and Environmental Regulation" (2004) 22 *Environment and Planning C: Government and Policy* 65
[84] <http://www.themedpartnership.org>

go so far as to give non-State actors an entirely equal say in decision-making with States. Thus they may be invited to participate in implementation processes as they are in, for example, the Nairobi Convention and the Helsinki Convention.[85] Alternatively they may be invited to attend meetings as observers and may as such have a right to present information to the State Parties, as they are in, for example, the CCAMLR.[86] One is still left questioning then whether these rights are sufficient to satisfy the requirement of involving all relevant sectors in the ecosystem approach, or whether fuller engagement is required.

The use of a range of information in decision-making is also addressed in a number of regimes such as in the Helsinki Convention[87] and the Mediterranean regional seas programme. Article 4 of the Barcelona Convention requires, inter alia that the Parties carry out Environmental Impact Assessments before undertaking new activities that are likely to have a significant adverse impact on the marine environment. Article 12 provides for monitoring. These articles provide mechanisms to acquire the information necessary for effective decision-making under the ecosystem approach, but once again may not provide sufficiently robust mechanisms to ensure that "all forms of information and knowledge [***can***] be drawn upon in decision making". Once again, however, further details on the acquisition and use of information are found in some of the soft law instruments attached to some regimes. For example, HELCOM has adopted Ecological Quality Objectives (EQOs) and established monitoring and research programmes.[88] OSPAR's Biological Diversity and Ecosystems Strategy, also provides for the establishment of EQOs,[89] but adds also the assessment and monitoring of threatened species, the establishment of marine protected areas and assessment of human activities that may adversely impact on the ecosystem such as dredging and dumping. Similarly, the Antarctic Treaty system monitors human impacts on the Antarctic marine environment. Parties also monitor and report on debris and its impacts on marine life and monitor fish stocks in terms of individual

[85] See for example, HELCOM Recommendation 28E/9 "Development of Broad-Scale Marine Spatial Planning Principles in the Baltic Sea Area.
[86] Commission for the Conservation of Antarctic Marine Living Resources Rules of Procedure, Basic Documents December 2012 Rule 33.
[87] See Article 24 Helsinki Convention.
[88] See HELCOM Baltic Sea Action Plan, 2007.
[89] See OSPAR Commission, *Report on North Sea Pilot Project on Ecological Quality Objectives* (OSPAR Commission, 2006) on the development of these objectives.

size etc.[90]

The CCAMLR also points to the use of other mechanisms to implement the ecosystem approach in its soft law instruments. Various measures of relevance have been adopted such as on the establishment of marine protected areas[91] and

> "seabird by- catch mitigation measures, regulations on mesh size, a bottom-trawl prohibition around South Georgia and by-catch limits for several elasmobranch species. Compliance with MARPOL is promoted, in particular its annex V on garbage."[92]

Indeed, there are a number of regional fisheries management organisations with measures that incorporate ecosystem considerations into their management measures.[93] Most of these measures relate to limitations on by-catch whether of fish species or of other species. For example, The Commission for the Conservation of Southern Bluefin Tuna requires members to use certain measures to reduce by-catch and mitigate seabird mortality;[94] the Inter-American Tropical Tuna Commission requires its parties to take measures to limit by-catch of juvenile tuna as well as by-catch of species such as turtles, dolphins and sharks.[95] Similarly the International Commission for the Conservation of Atlantic Tuna bans the use of driftnets in the Mediterranean.[96]

Perhaps of greatest significance is that some of the soft law measures adopted have been used to adopt a more integrated approach to ocean governance. Thus soft law underpins the cooperation between the North-east Atlantic Fisheries Commission

[90] See generally <http://www.ccamlr.org/en/science/science>
[91] See Conservation Measures 91-01 to 91-04.
[92] UN General Assembly Oceans and the law of the sea Report of the Secretary-General UNGA 61/63 para 177 (footnotes omitted) referring to CCAMLR Conservation Measure 2501 (1996); Conservation Measure 25-02 (2003) and Conservation Measure 25-03 (2003).
[93] UNGA 61/63 (Ibid) para 176.
[94] Recommendation to Mitigate the Impact on Ecologically Related Species of Fishing for Southern Bluefin Tuna (Updated at the Eighteenth Annual Meeting – 10-13 October 2011). See CCSBT Report of the Eighteenth Annual Meeting of the Commission October 2011, http://www.ccsbt.org/site/bycatch_mitigation.php
[95] See, for example, Resolution C-13-01 Tuna Conservation in the EPO 2014-2016; Resolution C-12-09 Conservation of Bluefin tuna; Resolution C-07-03 to Mitigate the Impact of Tuna Fishing Vessels on Sea Turtles; Resolution C-05-03 on the Conservation of Sharks Caught in Association With Fisheries in The Eastern Pacific Ocean.
[96] ICCAT Resolution 03-04 Relating to Mediterranean Swordfish and Resolution 96-15 on Large-Scale Pelagic Driftnets.

(NEAFC) and OSPAR[97] and to coordinate fisheries activities and the protection of the marine environment in the North East Atlantic. NEAFC has also closed off sea-mounts to fishing to protect deep-water habitats so integrating protection of biodiversity and fisheries activities. In addition the parties have adopted amendments to incorporate the ecosystem approach into the founding treaty.[98]

Conclusions

There are a number of points that can be drawn from this admittedly brief review of practice in ocean governance. The first thing one might note is that the majority of examples discussed point to the continuing use of sectoral approaches to marine governance. While such approaches may be perceived to ensure efficiency in decision-making, there is growing evidence of a more integrated approach being adopted. This change reflects an understanding that efficient[99] decision-making may be better achieved by ensuring that decisions are coordinated across the full range of issues that impact on each other, as it should remove much of the need to take reactive measures to problems that arise from interactions that have not been considered where issues are regulated individually. This is most clearly seen in the increasing cooperation between international organisations, though it is also beginning to be addressed by higher level activities such as the cooperation between the FAO and the UNEP Global Progamme of Action for Marine Pollution from Land-based Activities.[100] In addition, while the majority of examples appear to be drawn from regimes focussed on the conservation or management of biodiversity and living marine resources, there is also evidence of the ecosystem approach being applied in regimes addressing other issues, such as marine pollution. For example, the Arctic

[97] Memorandum of Understanding between the North-East Atlantic Fisheries Commission and the OSPAR Commission http://www.neafc.org/system/files/opsar_mou.pdf.
[98] See for example NEAFC Recommendation 8 2013: Regulatory Measures for the Protection of Vulnerable Marine Ecosystems From Significant Adverse Impacts From 2013
[99] Efficient "(Of a system or machine) achieving maximum productivity with minimum wasted effort or expense" Oxford Dictionary (Oxford University Press) http://www.oxforddictionaries.com/definition/english/efficient
[100] See the Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting A/61/156 p.20.

Council has developed an Arctic Marine Strategic Plan[101] to *inter alia* implement the ecosystem approach in relation to the control of pollution. There is also evidence of account being taken of the transboundary impacts of activities across ecosystems. For example, the Benguela Current Large Marine Ecosystem Commission cooperates with a number of other organisations such as the South East Atlantic Fisheries Organisation in the provision of scientific information.[102] This growing integration points to improved implementation of the ecosystem approach and augurs well for its application at the national level.

Secondly, few, if any of the regimes provide for the application of all elements of the ecosystem approach. One of the areas highlighted here, is that little attention is paid to ensuring that all sectors of society are engaged in decision-making. While many of the regimes incorporate elements that focus on improving the quality of information upon which decisions are based less attention is paid to fuller forms of engagement such as co-decision making or delegated decision-making. In addition, engagement often focuses upon NGOs or similar bodies alone which may not actually represent al sectors of society. It is questionable therefore whether they have gone far enough to meet the requirement of involving all relevant sectors of society in the application of the ecosystem approach. But this is not a question that should be answered on the basis of theory alone. One of the challenges with engaging all sectors of society in decision-making is that it may slow individual decisions and if taken to the extreme could cause paralysis in decision-making systems. There is therefore a balance to be struck between engagement and efficiency. That need for balance is already evident in the ecosystem approach in the call for decisions to be made at the appropriate level, but a greater understanding of the forms that engagement could take and of the types of decisions that best lend themselves to engagement activities would be beneficial. For example, it may be appropriate to engage a variety of sectors of society in planning type activities, for example, with individual permitting decisions made largely by governments once detailed plans are in place. There is then a need for further analysis of decision-making in practice and for further testing of a variety of approaches to engaging society in decision-making.

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[101] Arctic Council, *Arctic Marine Strategic Plan* (http://wwwpameis/arctic-marine-strategic-plan2, 2004)

[102] See the Report on the Work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting A/61/156 p.20.

Thirdly, even where provision is made to incorporate an element of the ecosystem approach, often that incorporation is quite limited. For example, while there tend to be provisions on the acquisition of a range of information to feed into decision-making often the emphasis appears to remain upon the gathering of scientific data, with less attention being paid to other forms of information.

Despite these weaknesses, it is possible to point to the growing acceptance and application of the ecosystem approach and it is that growing acceptance that leads to the suggestion that this approach provides fertile ground for the development of integrated principal objectives and processes for ocean governance. The existing gaps in implementation of the ecosystem approach do, however, point to the need for considerable progress to be made before it is possible to say that the ecosystem approach as currently defined fulfils that role. There is also a need to consider its application in the context of other activities besides those reviewed here, activities such as the production of renewable energy, or the extraction of minerals and hydrocarbons. Once these issues have been more fully resolved clearer conclusions can be drawn as to the degree to which the ecosystem approach provides greater content to the concept of holistic ocean governance or (the illusive) integrated principal objectives and process.